AUTOMATED SURFACE OBSERVING SYSTEM (ASOS)

RELEASE NOTE

SOFTWARE VERSION - 2.79

February 13, 2004

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service / Office of Operational Systems/Observing Systems Branch
National Weather Service / Office of Science and Technology/Development Branch

Table of Contents

Table

Figures

1.0 Introduction

1.1 <u>Background</u>

Software version 2.79 (v2.79) was developed as an interim software solution to implement high-priority capabilities and functions prior to software version 2.80 (v2.80). Version 2.79 uses software version 2.7B (v2.7B) as its baseline and it operates on the new Acquisition Control Unit (ACU) single-board processor developed by Synergy Microsystems, Inc. It supports the interfaces for the new dew point temperature (DTS1), Ice Free Wind (IFW), and the All Weather Precipitation Accumulation Gauge (AWPAG) sensors. It also contains system maintenance log messages to help isolate hardware problems with the new ACU processor; which were added in v2.7B.

Version 2.79 will allow National Weather Service (NWS) management to complete deployment of the new processor to the remaining ASOS locations interfaced to the Federal Aviation Administration's (FAA) Weather System Processor (WSP - 34 sites) and the Terminal Doppler Weather Radar (TDWR - 40 sites) systems. New capabilities added to the software that affect users include the capability to transmit non-tornadic SPECI reports at any time, the displaying of the last transmitted METAR/SPECI report while a new pending report is also displayed, and the removal of hourly METAR report additive data, e.g., three-hourly pressure changes and three- or six-hourly precipitation amounts, from the remarks section of a SPECI report transmitted during the edit time of the hourly METAR report.

1.2 <u>Purpose</u>

This <u>ASOS Release Note</u> gives a summary of the changes found in ACU application software v2.79, since v2.7B.

2.0 General Information

The NWS is currently performing Operational Acceptance Tests (OATs) for the IFW and the AWPAG. Some ASOS sites may only have software installed that will support the new sensor for a specific OAT, e.g., v2.7A for IFW. While other sites might have the latest software (v2.79) that will support all three new sensors, but only one new sensor is installed to support its OAT, e.g., v2.79 with only the AWPAG installed. With this in mind, there are <u>Release Notes</u> available for each software version, i.e., v2.6A (DTS1), v2.7A (DTS1 and IFW), v2.7B (DTS1, IFW, and AWPAG), and v2.79 (v2.7B baseline) with the added capabilities to: 1) transmit non-tornadic SPECI reports at any time; 2) display the last transmitted METAR/ SPECI report during the edit time of the pending report; 3) the removal of hourly METAR report additive data from the remarks section of a SPECI report transmitted during the edit time of the hourly METAR report; and 4) provide ASOS wind data to the FAA's WSP and TDWR systems.

Software v2.6A supports the DTS1 and the installation of the new ACU single board computer processor. The algorithms for processing dewpoint temperature data for ASOS's products and messages have not changed. A new system maintenance log message was added in v2.6A to help isolate hardware problems with the new processor board.

The Vaisala 425 sonic anemometer, i.e., IFW, can only interface to ACU software versions beginning with v2.7A. (Software v2.6A was used as a baseline to develop v2.7A.) Like v2.6A, v2.7A can only be installed on the new processor board. Except for the implementation of the new 3-second gust sampling period, no changes were made to the ASOS wind algorithms (e.g., wind shift, variable wind direction, and peak wind remarks). Software v2.7A supports both the DTS1 and IFW sensors.

The AWPAG can only interface to ASOS using software versions beginning with v2.7B. The precipitation data processing algorithms in the ACU software are identical to those algorithms used by the Heated Tipping Bucket precipitation gauge. In other words, only the source of the data, i.e., precipitation sensor, has changed and the algorithms used to process the data for the ASOS products and messages are unchanged. Since the AWPAG has advanced self-test maintenance firmware, new maintenance pages and system log messages are available for the electronics technician. Software v2.7B can support the DTS1, IFW, and AWPAG sensors.

The Software Capabilities table below summarizes the available changes to each ASOS software version.

Table: Software Capabilities

Capabilities	Software Versions					
	2.60	2.63	2.6A	2.7A	2.7B	2.79
Old Multiple Board Processor (XYCOM)	X	X	-	-	-	-
Old XYCOM with Interface to FAA's WSP System	-	X	-	-	-	-
New Single Board Processor (Synergy Microsystems, Inc.)	-	-	X	X	X	X
Vaisala DTS1 Dew Point Temperature Sensor	-	-	X	X	X	X
Vaisala IFW 425 Sonic Anemometer	-	-	-	X	X	X
Ott AWPAG Precipitation Gauge	-	-	-	-	X	X
Transmitting Non-Tornadic SPECIs at Any Time	-	-	-	-	-	X
Display Both Pending and Last Transmitted Reports	-	-	-	-	-	X
Remove Hourly Additive Data From SPECI Reports	-	-	-	-	-	X
ASOS Interface to FAA's WSP and TDWR Systems	-	-	-	-	-	X

X - Available Capability

2.1 Verifying Installation of Software Version 2.79

Starting at the Operator Interface Device's (OID) 1-Minute Screen, use the commands REVUE-SITE-VERSN-SW to verify the installation of the v2.79 ACU application software. (See Figure 1 below.) If you are not sure you are looking at the 1-Minute Screen, press the EXIT function from the current page and that will return you to the 1-Minute Screen. If the EXIT function does not exist, but the SIGN function does, then you are looking at the 1-Minute Screen. (See Figure 2 on page 4.)

```
 14:42:07 02/07/04 1942Z                                    STERLING #2
┌───────────────────────────────────────────────────────────────────────┐
│ UNIT    BOARD    NAME            DEVICE   VERSION   DATE                 │
│                                                                         │
│ ACU     CPU A    PSOS OS         EPROM    2.5       04/19/01             │
│         CPU B    PSOS OS         EPROM    2.5       04/19/01             │
│         MEMORY   ACU APPLICATION EPROM    2.79      12/19/03             │
│         MEMORY   DCP APPLICATION EPROM    2.79      12/19/03             │
│                                                                         │
│ DCP-1   CPU A    BOOT            EPROM    1.90      11/03/97             │
│         CPU B    BOOT            EPROM    1.90      11/03/97             │
│         MEMORY   DCP APPLICATION RAM      2.79      12/19/03             │
│                                                                         │
│ DCP-2   CPU A    BOOT            EPROM    1.90      11/03/97             │
│         CPU B    BOOT            EPROM    1.90      11/03/97             │
│         MEMORY   DCP APPLICATION RAM      2.79      12/19/03             │
│                                               SOFTWARE VERSIONS │
│                                             ┌─────┬─────┬─────┐  │
│                                             │ PRINT           │  │
│                                             ├─────┼─────┼─────┤  │
│                                             │                 │  │
│                                             ├─────┼─────┼─────┤  │
│                                             │EXIT BACK        │  │
```

Figure 1: SOFTWARE VERSIONS Page (REVUE-SITE-VERSN-SW).

```
14:53:57 02/07/04 1953Z   *** HOURLY PENDING ***              STERLING #2
┌─────────────────────────────────────────────────────────────────────────┐
│  SKY        = OVC050                                                      │
│                                                                          │
│  VISIBILITY = 10SM                      TEMP/DEWPT  = 13.3 /-16.1 C  56 /03  F│
│  RVR        = RVRNO                     WIND DIR/SPD = 180/07             │
│  PRESENT WX =                           ALTIMETER   = 30.18              │
│                                                                          │
│  REMARKS    = RMK AO2 PWINO VISNO RY 22R                                 │
│                                                                          │
│ METAR KAAI 071953Z AUTO 18007KT 10SM OVC050 13/M16 A3018 RMK AO2 SLP221  │
│ T01331161 PWINO VISNO RY 22R $                                           │
│                                                                          │
│                                                                          │
│  METAR KAAI 071856Z AUTO 21006KT 10SM OVC050 12/M16 A3019 RMK AO2 SLP224 │
│ T01221161 PWINO VISNO RY 22R $ FIBI                                      │
│                                               ┌─────┬─────┬─────┐        │
│                                               │ PRINT                    │
│                                               ├─────┼─────┼─────┤        │
│                                               │ REVUE                    │
│                                               ├─────┼─────┼─────┤        │
│                                               │ SIGN      │ AUX │        │
└─────────────────────────────────────────────┴─────┴─────┴─────┴────────┘
```

Figure 2: OID 1-Minute Screen

3.0 Specific Changes In Software Version 2.79

This section will identify changes that are available to operators of the OID, as well as introduce the new interface to the FAA's WSP. Operators at the OID include the UNSigned user (UNS) and the following password levels: 1) OBServer (OBS); 2) Air Traffic Controller (ATC); 3) Electronics TEChnician (TEC); and 4) SYStem Manager (SYS).

No changes were made to the capabilities available to those accessing ASOS remotely.

3.1 <u>Transmit Non-Tornadic SPECI Reports at Any Time</u> (OBS and ATC)

Prior to v2.79, it was not possible to transmit a non-tornadic SPECI report during the edit time of the hourly METAR report. Also, if an automated SPECI were pending when the edit time for the hourly METAR began, that automated SPECI would be canceled and the critical changes that triggered the SPECI, if still valid, would be transmitted in the hourly METAR report. This could result in a significant delay in the transmission of critical weather information.

With the implementation of v2.79, the OBS and ATC can transmit a non-tornadic SPECI report during the edit time of the hourly METAR report. Automated pending SPECI reports will be transmitted at the end of their edit time if an hourly METAR report is also pending. In other words, a pending SPECI report will not be canceled if the edit time for the hourly METAR should begin while the SPECI is pending. This change will allow the timely transmission of critical weather information.

Tornadic SPECI reports can still be transmitted during the edit time of a pending hourly METAR report. This capability has not changed.

3.2 Display Last Transmitted METAR / SPECI Reports (UNS, OBS, ATC, TEC, SYS)

Prior to v2.79, the last transmitted report (i.e., METAR or SPECI) which was displayed on the 1-minute screen, was replaced by the pending report during the edit time for the new report. Under these conditions, it was not possible to easily see the conditions contained in the last transmitted report. These conditions are sometimes referred to as the "current official conditions."

Software v2.79 displays both the last transmitted report and the current pending report on the 1-minute screen during the edit time of the pending report. This allows the operator / user to conveniently reference the "current official conditions" with those in the pending report.

3.3 Remove Hourly Additive Data From SPECI Reports (UNS, OBS, ATC, TEC, SYS)

Prior to v2.79, if a tornadic SPECI were generated during the hourly METAR edit time, then any hourly additive data group(s), e.g., three-hourly pressure change and tendency, would be included in the remarks section of the SPECI report. This encoding practice was incorrect.

 In software v2.79, hourly additive data groups are encoded in the remarks section of the hourly METAR report only.

3.4 ASOS Interface to the Weather Sensor Processor (WSP) and Terminal Doppler Weather
     Radar (TDWR) Systems

This new interface will be used to provide ASOS wind information to the FAA's WSP system for use by air traffic controllers. The interface will be used only at those airport locations requiring this capability. The interface uses a dedicated, single user data port to transmit two-minute average wind speed (updated every 10 seconds), magnetic wind direction, and wind gust information. The data transfer will be made using a transmit-only RS-530 port transmitting at 1200 baud rate (can also be adjust to 2400, and 4800 baud rate).

This interface should be completely transparent to the other operators of ASOS.

4.0 Summary

Software v2.79 provides high-priority software and system changes to meet immediate needs for supporting operations. Allowing non-tornadic SPECI reports to be transmitted during

the edit time of the hourly METAR report will provide for faster transmission of critical weather conditions. Displaying both the last transmitted report when a new report is pending will provide a reference for how reported conditions are changing. Transmitting hourly additive data group(s) only in the hourly METAR report will correct ASOS report encoding.   The ASOS interface to both the WSP and TDWR will help support FAA operations at designated locations.

The changes in v2.79 will help enhance ASOS operations until software version 2.80 is available.

ACRONYMS

ACU   -   Acquisition Control Unit
ASOS   -   Automated Surface Observing System
ATC   -   OID Air Traffic Controller Password Level
AWPAG -   All Weather Precipitation Accumulation Gauge

FAA   -   Federal Aviation Administration

IFW   -   Ice Free Wind Sensor (Vaisala 425)

NWS   -   National Weather Service

OAT   -   Operational Acceptance Test
OBS   -   OID Observer Password Level
OID   -   Operator Interface Device

SYS   -   OID System Manager Password Level

TDWR -   Terminal Doppler Weather Radar
TEC   -   OID Electronics Technician Password Level

UNS   -   OID Unsigned User Level

WSP   -   Weather Sensor Processor